

The southern African species of Neriidae (Diptera)

by

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ABSTRACT

The southern African Neriidae are characterised relative to other acalyptrate families and distinguished from the Micropezidae, the only other family of Neriioidea represented in the subregion. The Afrotropical fauna of Neriidae is discussed and *Chaetonerius* Hendel, 1903 (the only African genus) is distinguished from Oriental and Australasian genera of Telostyliinae. The biology, behaviour and distribution of *Chaetonerius* species in southern Africa are discussed; two species have been reared from (decaying) pumpkin (*Cucurbita pepo* L.). Four species of *Chaetonerius* are recorded from the subregion, two of which are described as new. An annotated species key is provided. The southern African species of Neriidae are: *C. apicalis* (Walker, 1849), *C. londti* sp. n., *C. nolae* sp. n. and *C. perstriatus* (Speiser, 1910). The male postabdomen is described for each species and although *C. apicalis* and *C. perstriatus* are not redescribed, intraspecific variation is reviewed.

INTRODUCTION

The Neriidae and Micropezidae are the two families of Neriioidea (*sensu* J. F. McAlpine 1989) represented in the Afrotropical Region. Both are predominantly tropical groups and are slender-bodied with relatively elongate legs, the fore pair being displaced well anterior to the mid and hind pairs. The Neriidae are readily diagnosed by having conspicuous porrect antennae with the inner, terminal edge of the second segment produced into a finger-like lobe and the arista terminally positioned. Southern African Neriidae, although similar in general facies (Fig. 1) to some of the micropezid species, are easily distinguished by other characters (diagnostic character states of Micropezidae in parentheses): postvertical bristles convergent; sternopleuron bare (nearly always with vertical fan of hairs); four pairs dorsocentral bristles (at most one pair); two pairs marginal scutellar bristles (one pair); costa thinned at subcosta (costa complete); apex of mid tibia with ventral spur (spur absent).

Two subfamilies of Neriidae have been proposed, namely Telostyliinae and Neriinae. Considerable confusion exists, however, as to the limits of the subfamily concepts, which may not be monophyletic groups. Two genera of Telostyliinae are represented in the Afrotropical Region, although one of them (*Telostylinus* Enderlein, 1922) is recorded only from the Seychelles. This genus is otherwise restricted to the Oriental and Australasian Regions and it is likely that the Seychelles species is an introduction (Barraclough 1992).

Chaetonerius Hendel, 1903 is the other Afrotropical genus. It is distinguished from *Telostylus* and *Telostylinus*, the two Oriental/Australasian genera of Telostyliinae (catalogued as such by Steyskal 1977), by having two notopleural bristles, the third antennal segment ovoid and not sharply pointed apically, without prominently exposed antennal sockets (this area not glossy) and fore tibiae and all femora Fig. 1.

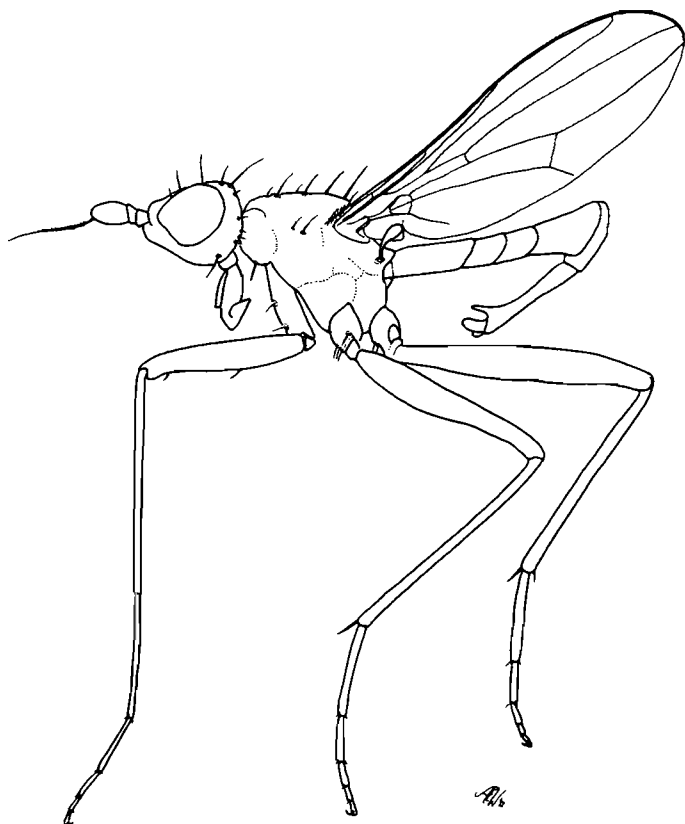


Fig. 1. *Chaetonerius nolae* sp. n., general appearance of entire male (small specimen).

unmodified (never clavate or swollen) (refer to Steyskal 1966). Note that in the latter paper *Chaetonerius* is distinguished from *Telostylus*, *Telostylinus* and the Australasian genus *Rhoptrum* (Hennig's 1937 concept of the Telostylinae) by having two notopleurals.

Chaetonerius is widespread in tropical parts of the Oriental and Afrotropical Regions. There are five named Oriental species (Steyskal 1977), one of which (*C. inermis* (Schiner, 1868)) just reaches the western fringes of the Australasian Region (Indonesia, Maluku). There are 15 Afrotropical species, inclusive of the two species described below (see also Barraclough 1993). Only one species (*C. alluaudi* (Giglio-Tos, 1895)) is recorded from the Indian Ocean Islands (Seychelles, Madagascar, Mauritius) by Steyskal (1980), although based on the material I have seen (including from the Comoros), several species occur there. Only a single species (*C. nyassicus* Enderlein, 1922 = *C. apicalis* (Walker, 1849)) was recorded by Steyskal from South

Africa, suggesting that the genus is most abundant in equatorial and subequatorial regions. This is confirmed by the present study, which records only four species from Africa south of the Zambezi River. Two of these species are widespread African species and the other two are restricted to the subregion. It seems likely that *C. londti* sp. n. (eastern Cape Province, South Africa) is the only species which will prove to be a regional endemic.

Attention should be drawn to the fact that species concepts in *Chaetonerius* (at least for the southern African fauna) are based predominantly on male characters and females may be difficult to identify. Such male characters include the development of anterolateral bristles on the apical section of the fore coxa, development of bristles and spines on the anteroventral surface of the fore femur, and, most importantly, the form and structure of the terminalia. To complicate the issue, intraspecific variation in the development of such bristles and spines may occur in some species. This is most noticeable in *C. nolae* sp. n., in which noticeably longer spines are typically differentiated at mid-length and subapically on the anteroventral surface of the fore femur in males, but which can be absent or very reduced in small specimens. A direct relationship between body size and the development of bristles and spines is highly probable. Such variation is apparently not unusual in the Neriidae (Steyskal 1965). There may also be marked intraspecific variation in femoral colour, this occurring in two of the four species represented in southern Africa. Aczél's 1954*b* key to the African species of *Chaetonerius* is based largely on the patterning of the femora and should consequently be used with caution.

BIOLOGY AND DISTRIBUTION

Chaetonerius species are commonly encountered in southeast Africa. They are sometimes synanthropic or at least opportunistic, and appear to be attracted to cooking odours in domestic dwellings. Specimens are often collected in houses, particularly on walls or window-panes. It is likely that immature stages develop in a diversity of decaying plant matter, although a phytophagous habit cannot be ruled out. The only definite rearing record in southern Africa is from decaying pumpkin (Zimbabwe, South Africa). Populations of *Chaetonerius* occur in suburban areas away from indigenous forest, suggesting that immature stages utilise cultivated gardens. This opportunistic habit enables adults to survive sometimes in drier regions from which they would normally be excluded. I have observed adults of *C. apicalis* in profusion near stands of the wild banana *Strelitzia nicolai* Regel & Koern, in Natal (South Africa), and it is possible that immature stages develop in the fruit or flowers. Also in Natal, adults have regularly been seen sitting on the rotting, fallen fruit of lemons (*Citrus limon* Burm. f.) in a shaded section of a suburban garden (P. M. C. Croeser, *pers. comm.*).

Adults are difficult to collect in indigenous forest. They appear to favour shaded areas and are sometimes found sitting (always in a characteristic head-downwards position) on tree trunks. I have seen specimens sitting near decaying fruit on a pathway leading through shaded coastal forest. It is probable that adults visit decaying fruit and animal droppings in such situations (banana is an effective bait). An interesting point is that all species except *C. londti* (known from limited material)

are not subject to seasonality and have been collected virtually throughout the year. It is possible then that different host plants are used during different seasons of the year.

Within southern Africa *Chaetonerius* is clearly restricted to the southeastern parts (Fig. 2), particularly subtropical wet forest, although the known distribution appears

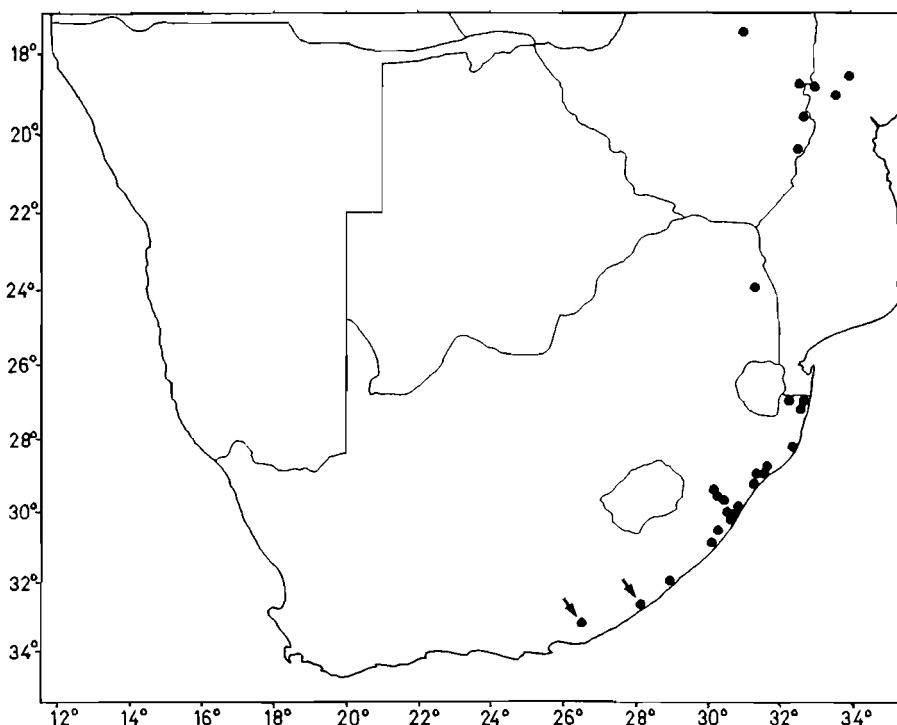


Fig. 2. Map showing known distribution of *Chaetonerius* species in southern Africa (arrowed localities refer to the endemic species *C. londti* sp. n.).

disjunct. This is possibly explained by incomplete collecting. There are currently two major centres of distribution. The first encompasses the eastern highlands of Zimbabwe and adjacent areas of western Mozambique, the second covers coastal areas of Natal and Transkei (South Africa) from Kosi Bay in the north (26°53'S:32°55'E) to East London (33°02'S:27°55'E) in the south. I have seen material from only two closely approximated localities in the eastern Transvaal (Mariepskop and Blyde River Canyon) and further collecting is required to elucidate the distribution of *Chaetonerius* in that part of South Africa.

MATERIALS AND METHODS

This study was based on the examination of dry, pinned adult specimens. All unidentified collections in southern Africa were examined and type material was loaned from European depositories. For the purposes of this study southern Africa

comprises Namibia, Botswana, Zimbabwe, Mozambique south of the Zambezi River and South Africa (inclusive of Swaziland and Lesotho). The acronyms used for depositories referred to below are listed together with their respective curators/technicians (in parentheses):

- AMSA — The Australian Museum, Sydney, Australia (D. McAlpine)
 BMNH — The Natural History Museum, London, United Kingdom (J. Chainey)
 DMSA — The Natural Science Museum, Durban, South Africa (C. Quickelberge)
 MRAC — Musée Royal de l'Afrique Centrale, Tervuren, Belgium (E. De Coninck)
 NMBZ — The Natural History Museum, Bulawayo, Zimbabwe (R. Sithole)
 NMHW — Naturhistorisches Museum Wien, Vienna, Austria (R. Contreras-Lichtenberg)
 NMSA — Natal Museum, Pietermaritzburg, South Africa
 PPRZ — Plant Protection Research Institute, Harare, Zimbabwe (W. Munetsi)
 SANC — National Insect Collection, Plant Protection Research Institute, Pretoria (M. Mansell)
 ZMHB — Zoologisches Museum an der Humboldt-Universität zu Berlin, Germany (H. Schumann)

The head of southern African *Chaetonerius* species has up to three pairs of fronto-orbital bristles. The posterior bristle is well-developed and positioned anterior to the ocellar triangle, the anterior bristle (when present) posterior to the antennal insertions and the mid bristle about midway between the posterior bristle and the antennal insertions.

The term 'scapular bristle' refers to a very small bristle or setula positioned just lateral to the dorsocentral line on each side, at the anterior extremity of the mesonotum about midway between the upper margin and the neck region below.

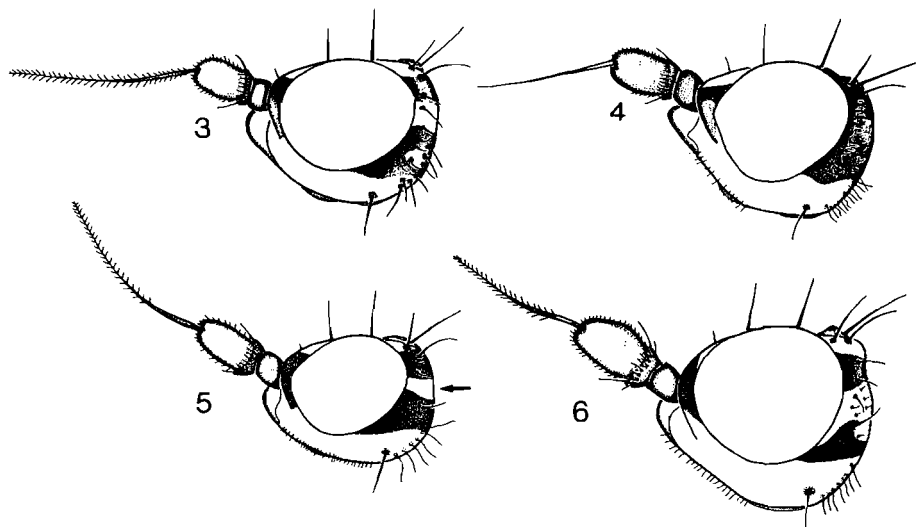
Bilaterally symmetrical structures are described in the singular. The label data of holotypes are quoted exactly as they appear, although supplementary information is sometimes given in square parentheses; a slash denotes the end of a line of print and a semicolon separates data quoted on different labels. Holotype measurements are given in parentheses following the range for other specimens examined. The following data are presented in the list of synonymy: type localities (for described species) of all nominal species; the status, sex and depository of each primary type; all previously used generic combinations and major references. Measurements of the head and thorax exclude the antennae. Wing length was measured from the humeral crossvein to the wing-tip. The male and female of each new species are treated separately; for the female only significant differences from the male are listed.

The male postabdomen was cleared in warm KOH, after which taxonomically important structures were described and figured. Illustrations of the male terminalia show all apparent vestiture; all are to the same scale. Profile views show bilaterally symmetrical structures from one side only, the cercus above and the surstylic region below.

Key to the southern African species of *Chaetonerius*

[Diagnostic characters are cited first in each half-couplet. Supplementary, qualifying information follows in square parentheses.]

- 1 Postgenal region of head with mostly dark setulae; facial region pale. Sternopleuron usually entirely dark, sometimes faintly pale on ventral section only. [Head profile as in Fig. 3. Male fore femur without posteroventral row of spines; anteroventral surface usually with dark serial hairs only (Fig. 7), very small subapical spine sometimes differentiated. Male postabdomen (Figs 11–12): surstylus bilobed, upper lobe very slender, medioventrally directed such that apex is concealed by lower lobe in profile, lower lobe broad and thumb-like in profile with dense vestiture.] **apicalis** (Walker, 1849)
- Postgenal region of head with pale hairing (sometimes darkened to form setulae in male of *C. nolae* sp. n.). Sternopleuron dark with pale colour on much of upper half (if pale ground colour not visible or obscured by pruinescence then face dark). [Male fore femur usually with posteroventral row of spinules; anteroventral surface usually with spines differentiated. Male postabdomen: surstylus with only one lobe.] 2
- 2 Mid and hind femora always patterned, typically dark with fairly conspicuous yellow band positioned at apical third to two-fifths (often partly or mostly pale along dorsal and ventral surfaces, sometimes pale basad of yellow band with dark ground colour restricted to part of anterior or posterior femoral faces). [Head profile as in Fig. 6. Male fore femur with anteroventral spines of similar length along entire length, longest spines reaching about two-fifths femur width (Fig. 10). Male postabdomen (Figs 17–18): cercus much broader apically, at least 2,0–3,0 X basal width, apical margin very broadly rounded in dorsal view; surstylus unusually elongate, subequal in length to cercus, noticeably broader apically (spoon-shaped) in profile.] **perstriatus** (Speiser, 1910)
- Mid and hind femora entirely pale to dark brown without patterning or conspicuous pale band (sometimes paler above in female of *C. nolae* sp. n.). [Male fore femur nearly always with noticeably longer spines (at mid-length and/or subapically) differentiated in anteroventral row (Figs 8 & 9). Male postabdomen: cercus narrower apically in dorsal view, apical margin fairly sharply rounded (Fig. 16) or narrowly to sharply pointed (Fig. 14); surstylus much shorter, about half length of cercus, finger-like in profile.] 3
- 3 Wing often mostly pale brown infuscated, usually darker tinged along costal margin at least to R_{2+3} . Male: fore coxal anterolateral bristles moderately developed along apical one- to two-thirds; fore femoral anteroventral row typically with noticeably longer spines differentiated at mid-length and subapically respectively (Fig. 9). [Head profile as in Fig. 5. Male postabdomen (Figs 15–16): epandrium very slender in profile and dorsal view, completely sclerotised mid-dorsally, lateral margins with inconspicuous hairs.] **nolae** sp. n.
- Wing hyaline, except usually pale brown tinged around apex of R_{2+3} . Male: fore coxal anterolateral bristles moderately to well-developed along apical three-quarters; fore femoral anteroventral row with noticeably longer and stronger spine differentiated subapically only (Fig. 8). [Head profile as in Fig. 4. Male postabdomen (Figs 13–14): epandrium short and stout, relatively broad in dorsal view, not sclerotised mid-dorsally, lateral margins with conspicuous hairs.] **londti** sp. n.



Figs 3–6. Head profiles of *Chaetonerius* species, showing all bristles, vestiture and patterning. 3. *C. apicalis* (Walker). 4. *C. londti* sp. n. 5. *C. nolae* sp. n. 6. *C. perstriatus* (Speiser).

Chaetonerius apicalis (Walker, 1849)

Figs 3, 7, 11–12

Calobata apicalis Walker, 1849: 1055. Lectotype ♀, 'West Africa' (BMNH, examined).

Chaetonerius apicalis: Enderlein, 1922: 148; Hennig, 1937: 276; Aczél, 1954a: 161, 1954b: 12, 1955a: 109, 1955b: 85; Steyskal, 1980: 578.

Chaetonerius nyassicus Enderlein, 1922: 148; Hennig, 1937: 275; Steyskal, 1980: 578. Holotype ♂, Langenburg, Tanzania (ZMHB, examined).

Telostylus fascipes Brunetti, 1929: 34. Holotype ♂, Kampala, Uganda (BMNH, examined).

Chaetonerius fascipes: Steyskal, 1980: 578.

Discussion: This is probably the most widespread African species; based on current records (Steyskal 1980) it is distributed from West Africa through equatorial regions to southeast Africa. In South Africa it is restricted to the coastal regions of Natal. The nominal species *Chaetonerius nyassicus* and *Telostylus fascipes* were recently (Barracough 1993) synonymised with *apicalis*. I am not redescribing the species, having only examined southern African specimens; Aczél (1954b) has in any event comprehensively described and figured *apicalis* based on more than 200 central African specimens.

There are no direct records of association with particular fruits or other (decaying) organic matter in southern Africa, although such associations are likely to be comparable with those observed for the species in central African countries such as Zaïre and Congo. Thus Aczél (1954b) recorded *apicalis* adults from the fruits of *Rollinia*, fresh elephant droppings, coffee trees (berries) and millet, cocoa-beans, fruits of *Borassus*, *Ficus* and *Solanum*.

Variation (external features): Femora dark yellow-brown to pale brown with irregular darker streaks, apical regions often darker; pale apical band sometimes apparent on hind femur; sometimes femora mostly dark brown (particularly on anterior and

posterior faces) in specimens from a particular locality. Abdominal dorsum rarely entirely black (due to dark, gelatinous contents). Fore femur of male with anteroventral surface sometimes bearing very small subapical spine. Fore tibia of male with or without 1 ventral row of minute spinules.

Male postabdomen (Figs 11–12): Syntergosternite (segments 7+8) 0,6–0,9 X length of epandrium. Epandrium broadening towards apex in both dorsal and profile views (sometimes broader because surstyli folded outwards), variable in length, hairing virtually absent, completely sclerotised mid-dorsally. Cerci broad along much of length, fused dorsomedially and restricted to dorsal plane, blunt-ended apically in dorsal view. Surstylic region bilobed, upper lobe very slender and mainly bare, medioventrally directed such that apex is concealed by lower lobe in profile, lower lobe broad and thumb-like in profile with dense vestiture.

Material examined: MOZAMBIQUE: 2 ♂, Amatonga[s] Forest, 15.iv.1964, D. Cookson (NMSA); 1 ♀, Manhica, ix.1955, D. Will Smith (DMSA); 1 ♀, Panga Panga Forest, Inhemitanga, 21.viii.1971, E. Pinhey (NMBZ). SOUTH AFRICA: *Natal*: 2 ♂, Amanzimtoti, viii.1982, D. A. Barraclough (NMSA); 1 ♀, Durban, 1916, C. Akerman (NMSA); 1 ♂, Durban, 11.v.1921 (SANC); 2 ♀, Durban, xii.1930, W. E. Marriott, bait trap (SANC); 1 ♂, Empangeni, 24.iii.1990, [P. Reavell], in house (NMSA); 1 ♀, Empangeni, 20.iv.1991, [P. Reavell], in kitchen (NMSA); 4 ♂, Enseleni, 28°41'S:32°03'E, 26.vii.1980, R. M. Miller (NMSA); 1 ♀, Hawaan Forest, Umhlanga, 29°43'S:31°05'E, 27.ii.1992, Barraclough & Whittington, indig. dune forest nr. lagoon, 20 m (NMSA); 1 ♀, Maputa, vi.1914, H. G. Bryer (NMSA); 1 ♀, Mtunzini, 31°45'E:28°55'S, 20.iv.1987, [P. Reavell], in kitchen, 40 m (NMSA); 9 ♂ 4 ♀, Ndumu Reserve, Ingwavuma District, 1–10.xii.1963, B. & P. Stuckenberg (NMSA); 1 ♀, Pinetown, 21.xii.1908, G. F. Leigh (NMSA); 1 ♂ 1 ♀, Umhlanga Bush, near Durban, v.1961, B. & P. Stuckenberg (NMSA); 1 ♂ 2 ♀, Umhlanga Bush, Durban Dist., T. Schofield (NMSA); 3 ♂, Umlalazi Nature Res., SE2831DD, 26–27.i.1987, J. G. H. Londt, Dune forest & margin (NMSA); 1 ♀, Umtamvuna Nature Res., SE3030CC, 25–27.iii.1985, J. G. H. Londt, open grass, forest margin (NMSA); 1 ♀, Univ. of Zululand, 28°45'S:31°45'E, 16.v.1986, P. E. Reavell (NMSA); 1 ♂, Virginia Bush, 29°46'S:31°02'E, 27.ii.1992, Barraclough & Whittington, indig. forest, due W. Airport, 100 m (NMSA); 1 ♂, Westville, Durban, 2930DD, 24.v.1992, J. G. H. Londt (NMSA); 2 ♀, Zinkwazi, 29°17'S:31°27'E, 2.xi.1990, D. A. Barraclough, Coastal Forest, 50 m (NMSA); 6 ♂ 5 ♀, Zinkwazi, 29°14'S:31°23'E, 3–4.iii.1991, in house (NMSA).

***Chaetonerius londti* sp. n.**

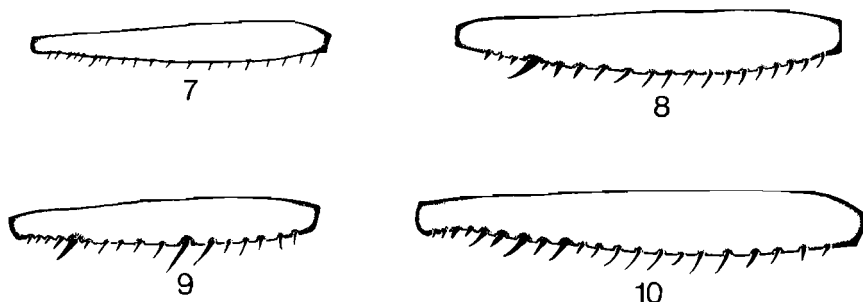
Figs 4, 8, 13–14

Holotype: SOUTH AFRICA: 'Ac.-E.L. / 122'; 'East London, / C.P. / 25.2. 1922' [Rectangular card, green perimeter]; 'HOLOTYPE ♂ / *Chaetonerius londti* / BARRACLOUGH' [Rectangular card, red perimeter]. In SANC. In good condition; possibly slightly teneral, right fore leg and both hind tarsi missing.

Etymology: Named for Dr Jason Londt, in recognition of his assistance with the collection of three *Chaetonerius* species during the preparation of this paper.

Male: Dimensions (in mm): Head/thorax 3,4–3,7 (3,4); wing 5,0–5,3 (5,0).

Colour/Pruinescence: Head medium brown, but proboscis, palp and basal third of arista yellow to yellow-brown and inner basal section of third antennal segment indistinctly brick-red (mesofrons predominantly unicolorous, ranging from pale to medium brown); pruinescence silver to very pale yellow, most evident on orbital plates lateral to insertion of bristles, and on parafacial, cheek, postgena and irregularly on occiput. Thorax medium brown, often with yellow colour visible on



Figs 7–10. *Chaetonerius* species, male fore femora, anterior view, showing development of anteroventral bristles and setulae (patterning and minor vestiture omitted). 7. *C. apicalis* (Walker). 8. *C. londti* sp. n. 9. *C. nolae* sp. n. 10. *C. perstriatus* (Speiser).

upper parts of sternopleuron and hypopleuron and between hypopleuron and scutellar base; pruinescence similar to head, usually very dense on pleuron, humeral callus, notopleural region and above wing base, also noticeably visible medially on mesonotum on and between rows of dorsocentral bristles and over much of scutellum mesad of bristles, narrow median vitta (ie. delineated on each side by darker ground colour) differentiated in pruinescence anterior to transverse groove. Legs: dark brown coxae with pruinescence similar to pleuron; femora pale to dark brown; tibiae yellow with darkened apices, tarsi slightly darker (ie. yellow-brown). Wing predominantly hyaline, often brown infuscated only along costal margin prior to insertion of R_{2+3} (length of infuscation about 5.0 X length of crossvein r-m). Abdominal dorsum various shades of brown, usually with narrow brown mid-dorsal vitta and paired yellow longitudinal vittae on each side (tergite 1 excluded), tergites 5–6 generally with yellow hind margins. Postabdomen yellow-brown to pale brown.

Head: Profile as in Fig. 4. Arista virtually bare, with microscopic pubescence only. Postgena with serial pale hairing, no dark setulae differentiated. Anterior fronto-orbital bristle present, very small, positioned about midway between antennal base and mid fronto-orbital.

Thorax: Scapular bristle present. 4 dorsocentral bristles. Fore coxa with relatively well-developed, stubby bristles along apical five-sixths of anterolateral margin. Fore femur with short spines differentiated along anteroventral surface, a single noticeably broader and longer dagger-like spine positioned subapically, length of this one-third to two-fifths femur width (Fig. 8); posteroventral surface with row of minute

spinules. Fore tibia with 2 rows of minute ventral spinules, these usually noticeably longer and stronger in apical half.

Abdomen: Dorsal outline unusually slender, apical 3 tergites sometimes strikingly narrower and only reaching about two-fifths maximum basal width. Postabdomen cleared in KOH (Figs 13–14): syntergosternite (segments 7+8) 0,8 X length of epandrium; epandrium folded outwards from unsclerotised dorsal midline, to produce short and stout appearance (slightly broader apically) in dorsal view, slightly narrower at mid-length in profile, conspicuous hairing over much of surface, more noticeably on lateroventral regions; cerci mainly in dorsal plane, fused and relatively broad basally, sharply tapered from lateral to medial margin in apical third (extreme apical region very narrow); surstylic region with single, slender finger-like lobe visible in profile, slightly broader apically and with dense vestiture along inner surface, about half length of cercus. Postabdomen *in situ*: epandrium strikingly compressed (unsclerotised dorsal midline forms sharp carina-like section), broader basally in dorsal view only; cerci and surstyli compressed about midline, thus fully visible in profile.

Female: Dimensions (in mm): Head/thorax 3,2–3,4; wing 4,8.

Colour/Pruinescence: Fore coxa yellow-brown below pruinescence (ie. paler).

Thorax: Fore coxa with weak anterolateral bristles restricted to apical one-sixth. Fore femur without posteroventral spinules, only a single subapical anteroventral bristle present, this weak, length two-fifths femur width. Fore tibia without ventral spinules.

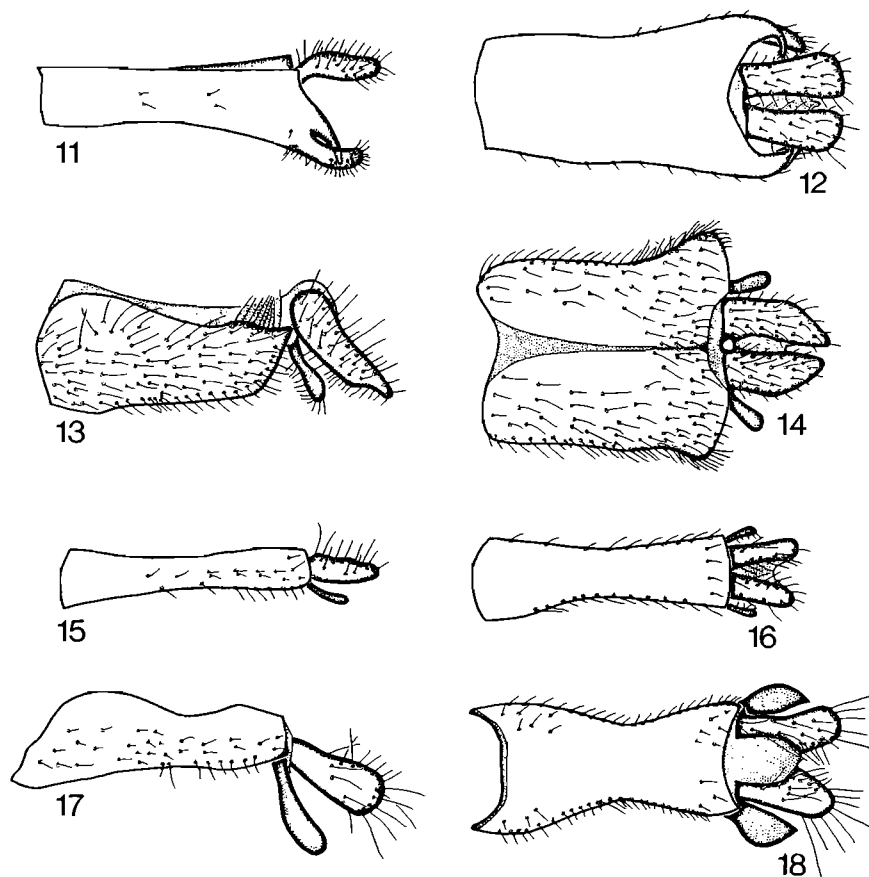
Other material examined: Paratypes: SOUTH AFRICA: *Cape*: 1 ♂ 2 ♀, East London, 2.viii.1922, 25.viii.1922 (SANC); 1 ♂, Resolution, Albany Distr., 8.xi.1921, A. Walton (NMSA).

Discussion: *Chaetonerius londti* is highly distinctive and does not have clear affinity with any of the described Afrotropical species. I have compared it with the type material of all named species and with the original descriptions of taxa with missing types (including *C. alluaudi* (Giglio-Tos, 1895)) from the Indian Ocean Islands). The shape of the epandrium, cerci and surstyli is disjunct from all African species which include males in their type series. Other unusual character states are the predominantly unicolorous mesofrons and (in dorsal view) the narrow abdominal outline.

The fact that *C. londti* appears to represent an isolated derivative of African *Chaetonerius* stock is suggested by its restriction to a small relatively temperate area of the eastern Cape Province of South Africa. Each of the other three species is widespread in tropical and subtropical parts of the subregion, and both *C. apicalis* and *C. perstriatus* range into central Africa.

The paratype from Resolution is likely to have been associated with a cultivated garden. Resolution is an arid region (F. W. Gess, *pers. comm.*) which could not normally support populations of Neriidae.

Note that when the male terminalia are cleared in warm KOH, the outline shape of the epandrium that results is quite different to that visible *in situ*. I have described both shapes (with respect to the *in situ* form only differences from the cleared terminalia are listed).



Figs 11–18. *Chaetonerius* species, male terminalia (epandrium, cerci and surstyli), profile and dorsal views respectively, showing all vestiture. 11–12. *C. apicalis* (Walker). 13–14. *C. londti* sp. n. 15–16. *C. nolae*. 17–18. *C. perstriatus* (Speiser).

***Chaetonerius nolae* sp. n.**

Figs 1–2, 5, 9, 15–16

Holotype: SOUTH AFRICA: 'Pietermaritzburg / Natal, S. Africa / B. & P. Stuckenberg / Blackridge 28-7-71'; 'HOLOTYPE ♂ / *Chaetonerius nolae* / BARRACLOUGH' [Rectangular card, red perimeter]. In NMSA; type number 562. In good condition.

Etymology: Named for Mrs Nola McCabe, formerly of Amanzimtoti, who first aroused my interest in the southern African Neriidae.

Male: Dimensions: Head/thorax 2.2–3.6 (3.2); wing 3.3–5.1 (4.7).

Colour/Pruinescence: Head pale (yellow, yellow-brown or orange-brown), but dark brown on facial region (sometimes pale above), apical half to three-quarters of arista, profrons at antennal base, much of antenna (inner surface of A.s.2 and inner basal

section of A.s.3 sometimes excepted), mesofrons (except anteriorly and usually medially), irregularly on occipital region (usually medially and always strikingly so at upper and lower margins of postocular region) and on at least section of palp and sometimes proboscis; pruinescence silver, most evident on pale ground colour (proboscis excepted). Thorax medium to dark brown, but (unless obscured by pruinescence) noticeably yellow or yellow-brown on humeral callus, notopleural and supra-alar regions (sometimes upper mesopleuron), on posterodorsal section of sternopleuron (sometimes anterior section of pteropleuron) and on upper hypopleuron extending upwards to scutellar base; pruinescence similar to head, sparse to dense on pleuron, but more dense on mesonotum on and between rows of dorsocentral bristles and on scutellum mesad of bristles, 2 narrow non-pruinescent (ie. dark brown) medial vittae usually differentiated anterior to transverse groove (sometimes yellow ground colour laterally on each side), and sometimes single narrow median vitta posterior to groove and reaching scutellum (vittae rarely fused along entire length of mesonotum). Legs: coxae irregularly yellow-brown and dark brown, although mid coxa usually darker and hind coxa mostly dark, pruinescence similar to pleuron; femora medium (rarely pale) to dark brown; tibiae yellow to pale brown with darkened apices, tarsi slightly darker (ie. yellow-brown) or occasionally dark brown. Wing mainly pale smoky-brown, dark brown infuscated along costal margin between insertions of R_1 and R_{2+3} , particularly nearer to latter vein. Abdominal dorsum with brown lateral margins and dark mid-dorsal vitta bounded by paired yellow vittae of variable width (dorsum rarely apparently entirely brown, sometimes predominantly yellow). Postabdomen medium to dark brown (syntergosternite, cercus and surstylus sometimes paler).

Head: Profile as in Fig. 5. Arista with short pubescence. Postgena with serial pale to dark hairing, no actual setulae differentiated. Anterior fronto-orbital bristle virtually always absent or very reduced.

Thorax: Scapular bristle present or absent. 4 dorsocentral bristles. Fore coxa with moderately developed bristles along apical half to two-thirds of anterolateral margin. Fore femur with short spines differentiated along anteroventral surface, with (usually) single much longer bristles differentiated subapically and particularly at mid-length (occasionally 2 bristles developed here), length of these bristles reaching half to two-thirds and half to three-quarters femur width respectively (Fig. 9); posteroventral surface with row of minute spinules (in unusually small specimens femur lacks posteroventral spinules and only longer bristles are differentiated anteroventrally, length of these about quarter to half femur width). Fore tibia with 2 rows of minute ventral spinules (absent in smaller specimens or when femoral spines/spinules reduced).

Abdomen: Dorsal outline unremarkable, apical 3 tergites never strikingly narrower. Postabdomen (Figs 15–16): syntergosternite (segments 7+8) 0,7–0,8 X length of epandrium; epandrium very slender, narrower at mid-length in profile and dorsal view, dorsal midline completely sclerotised, relatively inconspicuous hairing along lateral margins; cerci fairly slender, apical region tapered and narrowly rounded (sometimes almost sharply pointed); surstylic region with single, slender finger-like lobe visible in profile, about half length of surstylus.

Female: Dimensions (in mm): Head/thorax 2,5–3,3; wing 3,7–4,5.

Colour/Pruinescence: Face yellow to yellow-brown, occasionally pale brown. Fore coxa always yellow.

Thorax: Fore coxa with weakly developed bristles along, at most, apical two-fifths of anterolateral margin. Fore femur with or without inconspicuous ventral setulae subapically and at mid-length, length one-third to two-fifths femur width when present.

Other material examined: Paratypes: MOZAMBIQUE: 1 ♂, Panga Panga Forest, Inhemitanga, 21.viii.1971, E. Pinhey (NMBZ). SOUTH AFRICA: *Transvaal*: 2 ♂ 1 ♀, Mariepskop, 28.xi.1968, J. Brown, in bait trap (SANC); 1 ♂ 2 ♀, Blyde R. Canyon, 3.x.1969, H. D. Brown (SANC). *Natal*: 1 ♂, Amanzimtoti, viii.1982, D. A. Barraclough (NMSA); 1 ♂ 1 ♀, Ashburton, viii.1980, R. M. Miller, malaise (NMSA); 1 ♂, Bishopstowe, Longleigh Farm, 14.x.1972, I. Bampton (NMSA); 2 ♂ 1 ♀, Blackridge, Pietermaritzburg, v.1969, vii.1969, viii.1969, B. & P. Stuckenberg (NMSA); 1 ♂, Durban, xii.1930, W. E. Marriott, bait trap (DMSA); 1 ♂, Ferncliffe Forest Res., 29°33'00"S:30°20'30"E, 23.xi.1987, J. G. H. Londt, Mistbelt Mixed Forest, 975 m (NMSA); 1 ♀, Howick, 29°28'40"S:30°13'20"E, 8.xii.1990, A. E. Whittington, domestic ceiling (NMSA); 2 ♀, Karkloof Falls, 3.xii.1961, T. Schofield (NMSA); 1 ♀, Mission Rocks area, 28°17'E:32°29'S, 9.x.1992, J. G. H. Londt, Tree trunks nr. beach, 10 m (NMSA); 1 ♂ 1 ♀, Pietermaritzburg, 15.ix.1976, 8.xii.1979, Ray M. Miller (NMSA); 5 ♂ 7 ♀, Pietermaritzburg, Montrose, 29°34'35"S:30°20'40"E, 22.iii.1992, 23.iii.1992, 26.iii.1992, J. G. H. Londt, Banana Bait (NMSA, 1 ♀ AMSA); 4 ♂ 1 ♀, Pietermaritzburg, Montrose garden/house, 29°34'S:30°20'E, 30.iii.1992, J. G. H. Londt, 900 m (NMSA, 1 ♂ AMSA); 1 ♀, Pietermaritzburg, Town Bush, x.1976, R. Miller (NMSA); 1 ♂, Pietermaritzburg, Town Bush, 12.xii.1961, B. & P. Stuckenberg (NMSA); 5 ♂ 1 ♀, St Lucia Estuary area, 28°23'S:32°25'E, J. G. H. Londt, Coastal Bush / Forest, 10 m (NMSA); 1 ♂, Univ. of Zululand, 28°45'S:31°45'E, 10.viii.1986, P. E. Reavell, on wall, 75 m (NMSA). *Transkei*: 1 ♂, W. The Haven, 3228Bb, 25–28.vi.1979, R. Miller & P. Stabbins (NMSA). *Cape*: 1 ♂ 2 ♀, East London, ii.1922 (SANC); 1 ♂, Prospect, iv.1924, H. K. Munro, pumpkin (SANC). Additional material: SOUTH AFRICA: *Natal*: 1 ♀, Manguzi River, nr Maputa, xi–xii.1945, H. Bell-Marley (DMSA); 1 ♀, no data (probably Karkloof Falls) (DMSA). *Cape*: 3 ♂, East London, ii.1922 (SANC).

Discussion: It is possible that *C. nolae* is one of several east and southeast African species with close affinity. I have, for instance, seen four specimens of an undescribed species in NMSA (2 ♂ 2 ♀) from Sigor (Kenya), which has essentially the same external facies as *nolae*, but with a darker pleural region (upper sternopleuron noticeably darker) and distinctive male terminalia.

I have compared *nolae* with the type material of all named Afrotropical species of *Chaetonerius*, and in instances where type material was unobtainable or destroyed the original descriptions were examined. Only two species have close affinity, although both are clearly not conspecific. The type material of one of these, namely *C. alboniger* Hennig, 1937 from Cameroon, was destroyed (Barraclough 1993). I

have, however, seen two males in ZMHB which are undoubtedly conspecific with *alboniger*; one of these was collected only 20 km from the type locality. Ignoring the number of dorsocentral bristles (which may vary intraspecifically in *Chaetonerius* species), *alboniger* differs from *nolae* most notably in two important character states: the postocular region is predominantly dark without a conspicuous yellow band at mid-height; the pleural region (upper mesopleuron excepted) is entirely dark brown. It is striking how *nolae* (based on more than 50 specimens from 20 localities in Mozambique and South Africa) consistently has a broad yellow band across the postocular region at mid-height (arrowed region in Fig. 5). In addition it always has the posterodorsal section of the sternopleuron and a band between the upper hypopleuron and the wing base pale, in contrast to the remainder of the pleuron which is dark brown.

The second named species with close affinity is *C. simillimus* (Karsch, 1887), described from northern Angola (male lectotype and female paralectotype from ZMHB examined). As with *alboniger*, *simillimus* lacks the pale band across the postocular region. It is also notably distinguished from *nolae* by having yellow-banded femora and probably lacks the longer anteroventral spine at mid-length on the fore femur, which is typically present in many male specimens of *nolae*.

Given that *nolae* is such an abundant and widespread species in southern Africa, I have compared it with the widely distributed Oriental/Australasian species *C. inermis* (Schiner, 1868), type species of the genus. According to Steyskal (1977) this species is recorded from China, Indonesia and the Nicobar Islands. I have seen a single male in NMHW from the type series (the only available specimen according to Contreras-Lichtenberg, *pers. comm.*). It is quite distinct from *nolae* and has much broader palpi (in the male at least), the arista is predominantly pale, and only the lower two-fifths of the postocular region is dark brown.

Chaetonerius nolae is commonly collected in the coastal belt of Natal (South Africa); it may often be seen in suburban houses. It has presumably (based on label data) been reared from pumpkin in the eastern Cape Province.

Chaetonerius perstriatus (Speiser, 1910)

Figs 6, 10, 17–18

Nerius perstriatus Speiser, 1910: 192. Lectotype ♂, Kilimandjaro, Tanzania (ZMHB, examined).

Paranerius perstriatus: Enderlein, 1922: 153; Aczél, 1954b: 2.

Chaetonerius fuelleborni Enderlein, 1922: 145; Hennig, 1937: 272; Aczél, 1954b: 12; Steyskal, 1980: 578. Lectotype ♂, Langenburg, Tanzania (ZMHB, examined).

Telostylus uniannulatus Brunetti, 1929: 33. Holotype ♀, Zanzibar, Tanzania (BMNH, examined).

Chaetonerius uniannulatus: Hennig, 1937: 272 (spelt incorrectly as *uniannulus*); Aczél, 1954b: 12.

Chaetonerius perstriatus: Hennig, 1937: 272; Steyskal, 1980: 578.

Chaetonerius wittei Aczél, 1954b: 10 (1955b: 89), 1955a: 111; Steyskal, 1980: 578. Holotype ♂, riv. Bowa, Zaïre (MRAC, examined).

Discussion: This species is widespread in the tropical and subtropical parts of central, eastern and southeast Africa. Based on literature records and material in the present study, *perstriatus* is likely to be distributed from Zaïre through Uganda, Kenya, Tanzania and probably Malaŵi and Zambia to southeast Africa (Zimbabwe, Mozambique and South Africa). In South Africa it is restricted to Natal, where it is most abundant in coastal regions, but also occurs in the midlands. I have recently

(Barraclough 1993) synonymised the nominal species *Chaetonerius fueleborni*, *Telostylus uniannulatus* and *Chaetonerius wittei* with *perstriatus*. As with *C. apicalis* I have not redescribed *perstriatus* given that only southern African specimens have been examined. Aczél's (1955b) description of *wittei* should suffice until *Chaetonerius* is comprehensively revised.

Mention should be made that Hennig (1937: 275) considered *C. perstriatus* to be similar to *C. alluaudi* (Giglio-Tos, 1895), described from the Seychelles. The latter species was not considered in my recent review of the type material of African *Chaetonerius* species. It has also been recorded from Madagascar and Mauritius (Enderlein 1922; Hennig 1937; Aczél 1954b; Steyskal 1980). It is not possible to distinguish adequately *perstriatus* from Hennig's (1937) redescription of *alluaudi*, raising the possibility that it is a junior synonym of *alluaudi*. I have, despite recourse to several potential depositories (including the Natural History Museum in Paris), not been able to locate the type material of *alluaudi* (see discussion under *C. nolae*), but I am nevertheless virtually certain that the two species do not have affinity. I have examined specimens of *Chaetonerius* from the Comoros, Madagascar, Mauritius and Seychelles, and although there are several resident species, none of these (at least based on males) is close to *perstriatus*.

In southern Africa *C. perstriatus* has been reared from decaying pumpkin in Zimbabwe and South Africa, while adults are readily attracted to banana bait, even in suburban gardens. Note that both Harare (Zimbabwe) and Pietermaritzburg (South Africa) represent outlying localities where specimens were almost certainly associated with cultivated gardens.

Variation (external features): Anterior fronto-orbital bristle usually absent. Face of variable colour in male, ranging from pale to dark brown. Femora brown with yellow band positioned at apical one-third to two-fifths, although often partly or mostly pale along dorsal and ventral surfaces, also often mostly pale basad of band with dark ground colour restricted to part of anterior (and sometimes posterior) face; fore femur sometimes mostly dark. Wing with brown infuscation at apices of R_{4+5} (usually) and R_{2+3} . Fore coxa of male with anterolateral bristles moderately developed along apical two- to three-fifths. Fore femur of male with posteroventral row of minute spinules present or absent, length of anteroventral spines ranging from one- to two-fifths width of femur. Fore femur of female with or without ventral spines developed apically. Fore tibia of male with or without 2 ventral rows of minute spinules (absent when femoral spines reduced).

Male postabdomen (Figs 17–18): Syntergosternite (segments 7+8) 0.8–1.0 X length of epandrium. Epandrium short and stout, noticeably narrowed (constricted) at apical two-fifths in profile and dorsal view, hairing inconspicuously developed along lateral margins, completely sclerotised mid-dorsally. Cerci slender basally, but 2.0–3.0 X this width apically, very broadly rounded apically in dorsal view. Surstylic region with single, unusually elongate spoon-shaped and mainly bare lobe in profile, this subequal in length to surstylus.

Material examined: MOZAMBIQUE: 2 ♂ 3 ♀, Gorongosa Mountain, Manica-Sofala Dist., ix.1957, Stuckenberg, Gallery Forest, 840 m (NMSA). ZIMBABWE: 4 ♂ 4 ♀, Cashel, 19.xii.1948, Nat. Museum S. Rhodesia (NMBZ); 1 ♀, Chirinda Forest,

18.iii.1945, E. C. G. Pinhey (NMSA); 1 ♂, Chirinda Forest, Mt Selinda, 25.i.1955, B. R. S. P. G. [= B. & P. Stuckenberg] (NMSA); 1 ♀, Salisbury [= Harare], 27.iii.1980, P. L. Hancock (NMBZ); 2 ♂, Sby. [Salisbury = Harare] Expt. Stn., i.1974, P. A. Thomas, *ex* decaying pumpkin (PPRZ); 2 ♂ 1 ♀, N. Vumba, 18.iii.1965, 21.iii.1965, 5.v.1965, D. Cookson (NMSA). SOUTH AFRICA: *Natal*: 1 ♀, Durban North, 1.vii.1981, A. E. Whittington (NMSA); 1 ♂, Dhlinda Forest, Eshowe, 5–6.iv.1960, B. & P. Stuckenberg (NMSA); 1 ♂, Dlinza Forest Reserve, 2831Cd, Eshowe, 20–23.xi.1978, J. G. H. Londt, 450 m (NMSA); 1 ♂, Enseleni, 28°41'S:32°03'E, 26.vii.1980, R. M. Miller (NMSA); 1 ♂ 2 ♀, Makaheli For., *ca.* 5 km NE Mangusi, 2632DD, 30.xi–2.xii.1982, Barraclough, Londt & Stuckenberg, Forest (NMSA); 1 ♀, Mission Rocks area, 28°17'S:32°29'E, 9.x.1992, J. G. H. Londt, Tree trunks nr. beach, 10 m (NMSA); 4 ♂ 1 ♀, Oribi Gorge Reserve, Umzimkulwana Valley, 21–28.xi.1960, B. & P. Stuckenberg (NMSA); 1 ♀, Pietermaritzburg, Botanical Gardens, 27.vi.1991, S. Kitto (NMSA); 1 ♀, Pietermaritzburg, Montrose - in garden, 2930CB, 3.iv.1987, J. G. H. Londt, on window in house (NMSA); 1 ♀, Pietermaritzburg, Montrose - in garden, 2930CB, 16.ix.1989, J. G. H. Londt (NMSA); 1 ♂ 1 ♀, Pietermaritzburg, Montrose, 29°34'35"S:30°20'40"E, 23.iii.1992, 26.iii.1992, J. G. H. Londt, Banana Bait (NMSA); 2 ♂ 1 ♀, Pietermaritzburg, Montrose garden/house, 29°34'S:30°20'E, 30.iii.1992, J. G. H. Londt, 900 m (NMSA); 1 ♂, Pietermaritzburg, Prestbury, 7.v.1983, R. M. Miller (NMSA); 1 ♀, Pinetown, 8.iii.1954 (NMSA); 1 ♂, Umbilo, Durban, 17.i.1951, A. L. Bevis (DMSA); 1 ♂, Umhlanga Rocks, 9.v.1957, Schofield (NMSA); 1 ♀, [U]mtamvuna Nature Res., 3130AA, 10–15.i.1982, J. G. H. Londt (NMSA); 1 ♀, Umtamvuna Nat. Res., "Clear waters", 31.x.1987, J. Mannin[g] (NMSA); 1 ♀, Virginia Bush, 29°46'S:31°02', 27.ii.1992, Barraclough & Whittington, indig. forest, due W. Airport, 100 m (NMSA); 1 ♀, Winklespruit, v.1917, C. Akerman (NMSA).

ACKNOWLEDGEMENTS

I am indebted to the curators and technicians listed under 'Materials and Methods' for the loan of undetermined material and type specimens. I particularly thank Dr H. Schumann (ZMHB) for the extended loan of African *Chaetonerius* type material; this paper could not have been completed without his assistance. Dr F. Gess searched unsuccessfully for specimens of Neriidae in the collections of the Albany Museum (Grahamstown). Dr B. Stuckenberg (Director, Natal Museum) kindly supplied me with information about the collection and behaviour of *Chaetonerius* species in southern Africa. Mr A. Whittington (Entomology Dept., Natal Museum) assisted with some of the artwork. Dr Stuckenberg, Dr J. Londt (Assistant Director, Natal Museum) and Mr Whittington critically reviewed the manuscript. I am grateful to the Foundation for Research Development for financial support.

REFERENCES

- ACZÉL, M. L. 1954a. Neriidae in the collection of the Musée royal du Congo belge. *Revue de Zoologie et de Botanique Africaines* **49** (1-2): 161–166.
 ——— 1954b. Neriidae of the Belgian Congo (Diptera, Acalypterae). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* **30** (39): 1–23.
 ——— 1955a. Neriidae in the collections of the Musée Royal du Congo Belge, Tervuren. Supplement. *Revue de Zoologie et de Botanique Africaines* **51** (1-2): 109–111.

- . 1955b. Neriidae (Diptera, Acalyptrata). *Exploration du Parc National de l'Upemba. I. Mission G. F. de Witte* **38** (5): 85–92.
- BARRACLOUGH, D. A. 1992. Redescription of *Cothornobata taeniata* (Macquart 1843) n. comb.: sole Afrotropical representative of the Eurybatinae (Diptera Micropezidae). *Tropical Zoology* **5** (1): 25–30.
- . 1993. Review of the type material of African *Chaetonerius* species (Diptera: Neriidae), with lectotype designations and new synonymy. *Journal of African Zoology* **107** (3): 269–278.
- BRUNETTI, E. 1929. New African Diptera. *Annals and Magazine of Natural History* (10) **4** (19): 1–35.
- ENDERLEIN, G. 1922. Klassifikation der Micropeziden. *Archiv für Naturgeschichte* (A) **88** (5): 140–229.
- HENNIG, W. 1937. Übersicht über die Arten der Neriiden und über die Zoogeographie dieser Acalyptraten-Gruppe (Diptera). *Stettiner Entomologische Zeitung* **98**: 240–280.
- MCALPINE, J. F. 1989. Phylogeny and classification of the Muscomorpha. In: McAlpine, J. F. ed. *Manual of Nearctic Diptera*. Volume 3. Ottawa: Agriculture Canada, Research Branch. (Monograph; No. 32) pp. 1397–1518.
- SPEISER, P. 1910. 10. Diptera. 5. Cyclorhapha, Aschiza. *Wissenschaftliche Ergebnisse der Schwedischen Zoologischen Expedition nach dem Kilimandjaro, dem Meru und den Umgebenden Massaissteppen Deutsch-Ostafrikas, 1905-1906, unter Leitung von Prof. Dr. Yngve Sjöstedt* **2**: 113–202.
- STEYSKAL, G. C. 1965. Synonymy of the genera *Antillonerius* and *Imrenerius* (Diptera: Neriidae). *Proceedings of the Entomological Society of Washington* **67** (1): 60.
- . 1966. Notes on flies captured in treetops in Malaya (Diptera: Empididae, Neriidae, Platystomatidae, Sepsidae, Muscidae). *Proceedings of the United States National Museum* **120** (3562): 1–16.
- . 1977. Family Neriidae. In: Delfinado, M. D. & Hardy, D. E. eds. *A catalog of the Diptera of the Oriental Region, Volume III, Suborder Cyclorhapha (excluding Division Aschiza)*. Honolulu: University Press of Hawaii pp. 8–11.
- . 1980. Family Neriidae. In: Crosskey, R. W. ed. *Catalogue of the Diptera of the Afrotropical Region*. London: British Museum (Natural History) p. 578.
- WALKER, F. 1849. *List of the specimens of dipterous insects in the collection of the British Museum* part. 4. London: British Museum.

Date received: 31 October 1992